

Srijon Sadhukhan
XI B 29
Chem
NB

KENDRIYA VIDYALAYA SANGATHAN, MUMBAI REGION
SESSION ENDING EXAMINATION -2017-18

CLASS : XI
TIME : 3 HRS

Subject : CHEMISTRY
Max Mark : 70

General instructions :

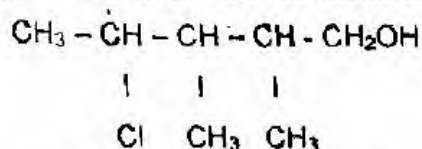
1. All questions are compulsory
2. Q no. 1 to 5 are very short answer questions and carry 1 mark each.
3. Q no. 6 to 10 are short answer questions and carry 2 marks each.
4. Q no. 11 to 22 are also short answer questions and carry 3 marks each.
5. Q no. 23 is a value based question and carries 4 marks .
6. Q no. 24 to 26 are long answer questions and carry 5 marks each.
7. Use log tables if necessary. Use of calculators is not allowed.
8. The Question Paper contains 5 printed pages.

1. Write the electronic configuration of Cu^{+1} ion. (Atomic number of Cu = 29)
2. State Mendeleev's period law.
3. Write van der Waals equation for one mole of a gas.
4. What is a Lewis Acid ? Give an example.
5. Why do alkali metals dissolved in ammonia give deep blue solution?
6. State Avagadro's law. Find the volume of 14g of nitrogen gas at STP.
7. (i) Draw the shape of d_{z^2} orbital. (ii) What observation in the alpha scattering experiment led to the conclusion that most of the space in an atom is empty?
8. (i) Give an example of a compound with intramolecular hydrogen bond.
(ii) Draw the shape of PCl_5 molecule using VSEPR model.
9. Give the principle involved in
(a) Steam distillation
(b) Paper chromatography

OR

1. How is nitrogen in an organic compound detected by a Lassaigne's test? Write the reactions involved in it.

10. (i) Give the IUPAC name of



- (ii) Write the structure of tert-Butylalcohol.

11. (i) Define molarity

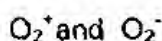
- (ii) Calculate the molarity of NaOH solution prepared by dissolving 4g of it to make 250mL solution? (Na=23, O=16, H=1)

12. What is the wavelength of light emitted when the electron in a hydrogen atom undergoes transition from an energy level with $n = 5$ to an energy level with $n = 2$?

13. Account for the following.

- (i) The size of a cation is always smaller than that of parent atom.
- (ii) Ionization enthalpy of N is more than that of O.
- (iii) Write the IUPAC name and symbol of the element with $Z = 118$.

14. Compare the relative stability of the following species on the basis of molecular orbital theory and indicate their magnetic properties with reason.



OR

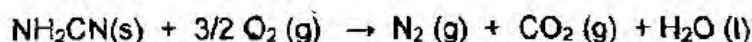
- (i) Deduce the shape of SF_6 molecule based on hybridization.

- (ii) How many sigma and pi bonds are there in Ethyne?

15. (i) State Dalton's law of partial pressures.

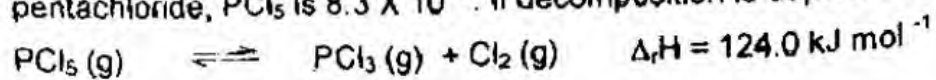
- (ii) Calculate the density of methane at 2.0 atm pressure at 27°C .
($R = 0.0821 \text{ L atm mol}^{-1} \text{ K}^{-1}$)

16. The reaction of cyanide, NH_2CN (s), with dioxygen was carried out in a bomb calorimeter, and ΔU was found to be $-742.7 \text{ kJ mol}^{-1}$ at 298 K. Calculate enthalpy change for the reaction at 298 K.



17. (i) State Hess's law of constant heat summation.
(ii) Calculate ΔG for the conversion of oxygen to ozone $3/2 \text{ O}_2 \rightarrow \text{O}_3$ at 298 K if K_p for the conversion is 2.47×10^{-29} .
18. (i) Balance the following redox reaction by oxidation number method
 $\text{MnO}_4^- + \text{I}^- \rightarrow \text{MnO}_2 + \text{I}_2$ (basic Medium)
19. (i) What are saline hydrides? Give an example.
(ii) What is cause of permanent hardness of water?
(iii) What do you understand by water gas shift reaction.
20. (i) Write the position isomer of But – 1- ene.
(ii) What is Inductive effect?
(iii) What are electrophiles? Give an example.
21. Illustrate the following with an example.
(i) Kharash effect
(ii) Friedel Craft's Acylation
(iii) Wurtz reaction
22. (i) What do you mean by BOD
(ii) List two gases which are responsible for green house effect?
(iii) Write any two components of photochemicalsmog?
23. Rita takes milk every day. She also takes curd and other milk products. She takes green leafy vegetables and fruits also. An adult body contains about 25g of magnesium and 1200g of calcium and 5g of iron. These elements must be part of our diet.
All enzymes that utilize ATP in phosphate transfer require magnesium as cofactor. The main pigment for the absorption of light in plants is chlorophyll, which contains magnesium. Anita does not like milk and takes lot of junk foods.
- (i) Why should we take green leafy vegetables in our diet?
(ii) How are green leafy vegetables rich in magnesium?
(iii) Name any two food items rich of Calcium?
(iv) What are values possessed by Rita, who takes milk every day and eats green leafy vegetables?

24. A) State Le - Chatelier 's principle.
At 437 K, equilibrium constant K_c for decomposition of phosphorous pentachloride, PCl_5 is 8.3×10^{-3} . If decomposition is depicted as,



- B) What would be the effect on K_c if
- a) More PCl_5 is added
 - b) Pressure is increased
 - c) The temperature is increased?

OR

- a) For the reaction at equilibrium
 $2SO_2(g) + O_2(g) \rightleftharpoons 2SO_3(g)$, the value of K_p is 2.0×10^{10} /bar at 450k.
Calculate the value of K_c for the reaction at the same temperature
($R = 0.082 \text{ bar L/K/mol}$)

- b) What do you understand by
1. Common Ion effect
 2. Buffer solution
 3. Solubility product

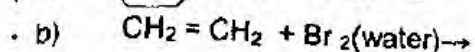
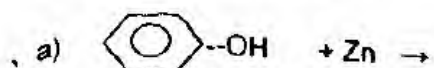
25. A) What happens when
- a) Boric acid is heated
 - b) Diborane react with ammonia
 - c) SiO_2 is treated with HF

- B) Describe the structure of diborane with diagram .

OR

- A) Account for the following.
- (i) Graphite is used as lubricant
 - (ii) $TiCl$ is more stable than $TiCl_3$
 - (iii) Boric acid is considered as a weak acid.
 - (iv) Carbon monoxide is highly poisonous.
 - (v) Boron is unable to form BF_6^{3-} .

26. (i) Complete the following.



ii) Name the products obtained by the ozonolysis of pent – 2- ene.

iii) Draw the conformations of ethane

OR

i) Carry out the following conversions.

a) Propene to propan-1-ol

b) Benzene to nitrobenzene

c) Ethyne to ethanol

ii) Draw the resonance of phenol
